CLAIMS

What is claimed:

1.   An immersive scanning device for imaging a scene comprising:

a head unit configured to receive an image light beam and generate an image data signal, said head unit comprising a rotating mirror for receiving said image light beam and an optical receiver for receiving said image light beam from said mirror and outputting said image pixel data signal in response thereto, said image data signal comprises a pixel image signal and a pixel distance signal; and

a support unit for supporting and rotating said head unit.

2.   The immersive scanning device of claim 1, wherein said optical receiver further comprises a distance generation unit for generating said pixel distance data signal.

3.   The immersive scanning device of claim 2, wherein said distance generation unit comprises a distance detection unit for generating said pixel distance data signal.

4.   The immersive scanning device of claim 1, wherein said optical receiver further comprises a two dimensional imager for generating a depth image representative of the distance of an object depicted by said pixel image signal from said head unit.

1　5.　The immersive scanning device of claim 1, wherein said depth image

2　comprises a polar plot depicting the distance of a plurality of objects represented by said

3　pixel image signal from said head unit.

1

1　6.　The immersive scanning device of claim 2, wherein said image pixel data

2　represents one pixel of captured image data.

1

1　7.　The immersive scanning device of claim 6, wherein said pixel distance

2　data represents the distance of an object depicted by said pixel from said head unit.

1

1　8.　The immersive scanning device of claim 2, further comprising a control

2　system for controlling said head unit and said support unit.

1

1　9.　The immersive scanning device of claim 2, wherein said optical receiver

2　comprises an imager for receiving said image light beam and generating said pixel image

3　data.

1

1　10.　The immersive scanning device of claim 9, wherein said imager comprises

2　a photomultiplier tube(PMT).

1

1　11.　The immersive scanning device of claim 9, wherein said imager comprises

2　a plurality of imagers.

1

1   12.   The immersive scanning device of claim 2, further comprising a motor for

2   rotating said mirror in accordance with said control system.

1

1   13.   The immersive scanning device of claim 2, wherein said optical receiver

2   further comprises an aperture screen for limiting the amount of said image light beam that

3   is received by said imager.

1

1   14.   The immersive scanning device of claim 13, wherein said aperture screen

2   comprises an aperture of a predetermined size and shape.

1

1   15.   The immersive scanning device of claim 13, wherein said aperture

2   comprises a square shaped aperture.

1

1   16.   The immersive scanning device of claim 12, wherein said mirror

2   comprises a 45° angled mirror.

1

1   17.   The immersive scanning device of claim 12, wherein said motor rotates

2   between 1000 and 12,000 revolutions per minute during an image capture operation.

1

1   18.   The immersive scanning device of claim 2, further comprising a user

2   interface for inputting control variable information.

1

1   19.   The immersive scanning device of claim 18, wherein said user interface

2   comprises a graphical user interface (GUI).

1

1   20.   The immersive scanning device of claim 17, wherein said pixel image

2   signal comprises data representative of a plurality of pixels captured during one

3   revolution of said mirror.

1

1   21.   The immersive scanning device of claim 17, wherein said pixel image

2   signal comprises data representative of 64,000 pixels captured during one revolution of

3   said mirror.

1

1   22.   The immersive scanning device of claim 17, wherein said camera support

2   further comprises a sweep motor for rotating said head unit about a predetermine axis of

3   rotation.

1

1   23.   The immersive scanning device of claim 22, wherein said sweep motor is

2   controlled by said control system.

1

1

1   24.   A method of capturing an immersive representation of a scene comprising

2 the steps of:

3   generating a distance detection light beam;

4   transmitting said distance detection light beam toward an object within a scene;

5   receiving an image light beam reflected from said object;

6   receiving said distance light beam reflected from said object;

7   providing a limited portion of said image light beam to an imager to produce an

8 image pixel signal representative of a portion of said scene; and

9   providing said distance light beam reflected from said object to a position sensing

10 device to produce a distance signal representative of the distance of said object as

11 depicted by said image pixel signal from a predetermined point.

1

1   25.   The method of claim 24, further comprising the step of outputting said

2 image pixel data signal and said pixel distance signal as an image data signal.

1

1   26.   The method of claim 24, further comprising the step of storing said image

2 data signal to a storage medium.

1

1   27.   The method of claim 24, wherein said step of providing comprises the step

2 of providing a limited portion of said image light beam to an imager to produce a

3 plurality of image pixel signals representative of one pixel of said scene.

1

1 28. The method of claim 24, wherein said portion of said scene comprises a

2 single pixel.

1

1 29. An immersive scanning device for imaging a scene comprising:

2 a head unit receiving an image light beam and generating an image data signal;

3 a support unit for supporting and rotating said head unit;

4 said head unit comprises a rotating mirror for receiving said image light beam;

5 an optical receiver for receiving said image light beam from said mirror and

6 outputting said image pixel data signal in response thereto; and

7 a control system for controlling the rotation of said head unit and said mirror in

8 accordance with predetermined control variable information.

1

1 30. An immersive scanning device according to claim 29, further comprising a

2 user interface for inputting said control variable information.

1

1 31. An immersive scanning device according to claim 29, further comprising a

2 storage memory for storing sad control variable information.

1

1 32. An immersive scanning device according to claim 30, wherein said user

2 interface comprises a graphical user interface.

1

1   33.   An immersive scanning device according to claim 30, wherein said optical

2   receiver comprises an imager responsive to an image light beam for generating a image

3   pixel data signal.

1

1   34.   An immersive scanning device according to claim 33, wherein said optical

2   receiver further comprises an aperture screen for limiting the amount of image light that

3   is received by said imager.

1

1   35.   An immersive scanning device according to claim 34, wherein said optical

2   receiver further comprises a focusing lens for focusing an image light beam onto said

3   aperture screen.

1

1   36.   An immersive scanning device according to claim 35, wherein said optical

2   receiver further comprises a distance detection unit for detecting the distance of an object

3   relative to said head unit.

1

1   37.   An immersive scanning device according to claim 36, wherein said imager

2   comprises a photomultiplier tube (PMT).

1

1   38.   An immersive scanning device according to claim 37, wherein said head

2   unit further comprises a scan motor for rotating said mirror in accordance with a signal

3   from said control system.

1   39.   An immersive scanning device according to claim 38, wherein said

2 support unit further comprises a sweep motor for rotating said head unit in accordance

3 with a signal from said control system.

1

1   40.   An immersive scanning device according to claim 39, further comprising

2 an image data storage unit for storing image pixel data representative of a captured scene.